Waterway and Wetland Handbook
CHAPTER 170
DRAINAGE DISTRICTS

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PURPOSE

Chapter 88 of the Wisconsin Statutes allows for the creation of drainage districts. Drainage districts can provide effective drainage of large tracts of land through action of a board with the power to plan, purchase, repair and construct drains within the bounds of its district and in some cases beyond the bounds of its district.

MECHANISM

Sections 30.195 (changing of stream courses), 30.20 (dredging), 88.31 (drainage projects which affect navigable streams), and 88.72 (removal of obstructions), afford the Department an opportunity to review drainage district projects which may impact navigable streams.

HISTORY

Uses of wetland for agricultural purposes date back to the mid-19th century. Early wetland uses were primarily restricted to harvesting of marsh grasses. The harvested hay was used for feed, insulation for ice houses, packing of beer bottles, weaving of rugs, and grazing. However, commercial cranberry operations date back to the early 1850's.

Laws providing for the drainage of private land predate the creation of the State. The territorial laws of 1839 P. 117, Section 12, provided that a third party arbitrator was to determine the location of ditches when the

surrounding farmers could not agree. After Wisconsin became a state Chapter 237, Laws of 1852, required a judicial review of drainage projects whenever the involved parties could not agree on the location of drains.

The first laws providing for the organized drainage of lands or community drains were Chapter 398, Laws of 1862, and Chapter 64, Laws of 1871, in which a procedure was established for creating county and town drains respectively. The county and town drainage laws were very similar, differing only in which governmental body administered the law. Chapter 401, Laws of 1891, allowed a quasi-public corporation to be organized under close judicial supervision for the purpose of draining agricultural land. This law allowed for the creation of drainage districts with the power to acquire lands and to go onto others' property for "the purpose of constructing, maintaining and operating drains, canals, ditches or the like for the drainage and reclaiming wet, submerged, overflowed and swamp lands..."

Drainage districts were given the power of eminent domain and the additional authority to dredge or straighten streams beyond the boundaries of its district if it found that such extra territorial projects were necessary to provide an adequate outlet.

In the mid-1890s several dry years encouraged land speculation on many of the central Wisconsin wetlands. The wetlands were quickly cultivated, but crops failed as the wetter years returned in the late 1890s. This spurred some of the most intense activity ever seen under the Drainage District laws.

Between 1900 and 1905 twelve drainage districts were established, draining 320,000 acres.

Chapter 444, Laws of 1907, expanded the powers of drainage districts to allow them to change the course of navigable streams in order to improve drainage. Chapter 557, Laws of 1919, required a permit from the Wisconsin Railroad Commission in order to alter navigable streams and is the forerunner of present Department authority. Between 1919 and the early 1930's there was very little interaction between the Railroad Commission and drainage districts. According to George Steinmetz, former Chief Engineer with the Public Service Commission, that was primarily because the Railroad Commission had a limited staff and was restricted to interest in larger streams and lakes whereas the drainage districts were primarily concerned with drainage of lands which relied initially on networks of small streams.

After the initial drainage of many of the central wetlands, crops failed due to insufficient amounts of nutrients. Continued crop failures forced many of the lands to become tax delinquent and eventually forced transfer of ownership to the counties. The land laid dry and barren and the threat of peat fires became a constant danger.

In the 1930's, the Work Progress Administration (WPA) set out to rectify some of the problems associated with the earlier failed drainage projects. The WPA built some 215 dams in order to reestablish groundwater levels. The higher groundwater helped to control peat fires, reestablish waterfowl areas, and promote agricultural crops such as cranberries and sphagnum moss. After completion of the dams, they were turned over to the local town, county or drainage district. Since many of these units of government were bankrupt or near bankruptcy the state felt compelled to protect the federal investment. Chapter 379, Laws of 1937, established a Water Regulatory Board with a duty to supervise operation and maintenance of the dams and dikes across drainage ditches and streams within drainage districts. The original board had an annual operating budget of $15,000 and existed until 1965. Chapter 163, Laws of 1965, transferred the responsibility of operation and maintenance from the Water Regulatory Board to the Public Service Commission. The interesting change during the transfer was the elimination of the word 'supervise' within the statute. The duties of the Commission then became the operation and maintenance of the dams instead of the supervision of operation and maintenance. The Water Regulatory Board remained in existence but became strictly advisory. The Board's life as an advisor was short lived, however, because Chapter 614, Laws of 1965, eliminated it. Unfortunately, the budget to operate and maintain has disappeared into other Departmental programs. Although the same responsibility remains in place today, it is

this lack of funds that has caused the Department to neglect its maintenance and operational duties on these structures.

Town drains, county drains and drainage districts are forms of drainage organizations existing prior to 1965. Chapter 572, Laws of 1963, revised the drainage laws of the state to create Chapter 88, Wis. Stats. This revision combined all formal drainage organizations into the regulatory review of Chapter 88 effective January 1, 1965.

Because of the DeGayner & Co., Inc. v. Department of Natural Resources, 70 Wis. 2d 936 (1975) case, which expanded the number of streams the Department considered navigable and the State v. Dwyer, 91 Wis. 2d 440 (1979) decision which concluded that the dredging statute (s. 30.20 Wis. Stats.) applies to both navigable and nonnavigable streams, our involvement with drainage districts became routine business through the 1970's.

Chapter 190, Laws of 1977, changed s. 30. 10, Wis. Stats., (Declaration of Navigability) so that a large portion of previously regulated streams were exempted. It stated that any ditch within an established drainage district was declared not navigable unless the Department could show the streams were navigable before ditching or had a previous stream history.

Chapter 339, Laws of 198 1, changed s. 30. 10, Wis. Stats., and allowed for maintenance dredging of "farm drainage ditches" that drain agricultural land, without permits from the Department. This legislation still allows the Department to require permits in some cases but overall our involvement with maintenance projects has been vastly reduced. (See Chapter 120, Dredging)

STANDARDS

Statutory

Section. 88.31. Section 88.31, Wis. Stats., requires drainage districts to apply for permits form the Department whenever projects affect navigable streams. Section 88.72, Wis. Stats., deals with drainage district projects which require the removal of a dam or obstruction in order to adequately drain the district. If the court finds that such projects will involve navigable bodies of water, it will direct the Board to file an application under the procedures of s. 88.31. The Department must grant a permit under s. 88.31, Wis. Stats., if it finds that:

a. The public health and welfare will be promoted.
b. The work is necessary to the proper operation of the drainage system.
c. The project will not materially impair navigability, public rights or public uses in the waters involved.

In addition to the above, s. 88.31, Wis. Stats., also declares scenic beauty as a public right which must be considered by the Department.

Section 30.19. Section 30.19, Wis. Stats., is applicable to drainage district projects. The following standards are applicable:

1. The project will not injure the public rights or interest.

2. The project will not cause environmental pollution as defined by s. 144.01(3), Wis. Stats.

3. The project conforms to platting and sanitation laws.

4. No material injury will result to the rights of any riparian owner on any affected waterway.

Section 30.195. Section 30.195, Wis. Stats., is applicable to navigable streams. The following standards require that:

1. The project must improve the economic or aesthetic value of the owner's land.

2. The project must not adversely effect the flood flow capacity of the stream.

3. The project must not be detrimental to public rights or the rights of other riparians located on the stream.

Section 30.195, Wis. Stats., does not apply to municipal or county owned lands in counties having a population of 500,000 or more.

Section 30.20. Section 30.20, Wis. Stats., requires that:

1. Dredging permits be consistent with the public interest.
2. Dredging contracts be consistent with public rights, protect the public interest and the interests of the state.
3. No contract can run for a longer period than five years.
4. A mining contract can run for no longer than 75 years.

Administrative

1. Wetlands. NR 1.95, Wis. Adm. Code, establishes general standards to be applied by the Department in decisions affecting wetlands. The Department presumes that wetlands are not to be adversely impacted or destroyed. NR 1.95 further specifies the balancing-test to be used by the Department when determining whether to grant a permit for a project which affects wetlands.

2. Shoreland areas. NR 115, Wis. Adm. Code, establishes administrative standards to be followed by counties in their administration of shoreland zoning ordinances. These standards should be reflected in approving drainage district projects.

3. Floodplain areas. NR 116, Wis. Adm. Code, establishes administrative standards to be followed by local units of government and the state. Permits or orders for channel changes or dredging should require applicants to conform with standards established in NR 116.

4. Environmental impacts. NR 150, Wis. Adm. Code, establishes procedures for determining whether a given project requires an Environmental Impact Statement (EIS). Channel changes and maintenance dredging are Type III actions (do not normally require an environment assessment). New dredging projects are Type II actions.

5. Dredging. NR 345, Wis. Adm. Code, establishes procedures to be used during the permitting process. It enables the investigator to determine if a permit should be issued or denied. The code uses two standards to determine the appropriate action, 1) whether or not the project will adversely affect the environment and, 2) whether or not the project is consistent with the public interest in the water involved.

6. Hydraulic Dredging. NR 347, Wis. Adm. Code. Regulation of dredging projects does not include a standard as such. The purpose of this rule is to provide a single mechanism to assure that the water regulation program, the industrial wastewater program, the waste treatment plan approval program, and the solid waste management program are appropriately reflected in decisions which regulate dredging made by this Department.

Attorney General's Opinions

1. OAG 17-74 - States that shoreland zoning adjacent to artificial bodies of water such as drainage ditches is applicable. The artificial ditch involved must be navigable, however.

2. OAG 95-74 - Clearly states that the agricultural exemption of s. 30.19, Wis. Stats., does not apply to drainage district projects because the drainage district statute (s. 88.31, Wis. Stats.) is more specific in nature and would take precedence over s. 30.19. The reasoning in this opinion seems to suggest that drainage districts are exempt from s. 30.19, Wis. Stats., if the work is restricted to unconnected ponds or grading on the bank.

3. OAG 117-74 - States that 30.20. Wis. Stats., is applicable to maintenance dredging projects within drainage districts.

Note: Since s. 30. 10, Wis. Stats., "Declaration of Navigability" was changed after these opinions were issued, some of the Attorney General's conclusions may no longer be applicable. They should be read carefully with those changes in mind.

Bureau of Legal Services Opinions

1. October 31, 1974, Memo. It was stated that the Department has the ultimate control of operation and maintenance of dams constructed on drainage ditches, regardless of whether or not the drainage district is solvent.

2. January 24, 1975, Memo. The Bureau of Legal Services outlined the relationship between ss. 30.20 and 88.31, Wis. Stats., when dealing with maintenance dredging projects within drainage districts. See Procedures Section in the next part of this chapter.

Secretary's Directive

In a memo dated December 6, 1977, Anthony Earl outlined to the District Directors and Water Management Investigators, how the Department would handle maintenance dredging procedures within drainage districts. This memo was a result of a compromise agreement between the Secretary and the Governor's office in which the Governor agreed to veto a bill in exchange for the Department expediting permit procedures within drainage districts. See the Procedures Section in the next part of this chapter.

PROCESS

The law is quite clear and directs that all drainage district projects be handled through the procedures set forth in s. 88.3 1, Wis. Stats. However, in the past some flexibility has existed with drainage district projects.

The Secretary's office and the Governor's office have agreed upon the procedures to be sued for maintenance dredging projects. Secretary Earl's December 6, 1977, memo directs staff to require only a s. 30.20, Wis. Stats., permit for maintenance projects, rather than s. 88.31, Wis. Stats., permit. The chief advantage to using s. 30.20, Wis. Stats., rather than s. 88.3 1, Wis. Stats., is that it does not require that a hearing be held. All new (not maintenance) dredging projects and projects of significant size (those requiring a judicial assessment) must be processed under s. 88.31, Stats. If the project is above the District's present budget, it will move to seek additional money before a local court via judicial assessment. In these cases, the court will direct the District to apply for a s. 88.31, Wis. Stats., permit rather than a s. 30.20 permit. Some discretion must be exercised when determining which statute to apply. As directed by the Secretary's office, we would like to handle as many maintenance dredgings as possible under s. 30.20, Wis. Stats., but the permit process will not be expedited if it becomes obvious that a special assessment is in line. In these cases, it may be desirable to start the permit

processing under s. 88.31, Wis. Stats. It may be advisable to consult with bureau staff to determine the appropriate statute.

Section 88.63, Wis. Stats., provides a fund to be used by the District for yearly maintenance projects. Although not technically correct, many districts have used this fund to dredge navigable streams.

Section 88.72, Wis. Stats., deals with the removal of obstructions, natural or artificial, from the outlet of drainage districts. The procedure set forth in this section requires action under s. 88.31, Wis. Stats.

Section 88.72, Wis. Stats., application will always be preceded by a judicial hearing. At that hearing, the court will determine if the project is necessary. If it finds that the project is necessary to afford an adequate outlet and that the project will affect navigable waters, it will direct the drainage board to apply for a permit as provided in s. 88.31, Wis. Stats.

APPLICATION

If the project is to be processed under Chapter 30 authority, the application should be treated the same as any other ss. 30.19, 30.195 or 30.20, Wis. Stats., permit (See Chapters 100, 110 and 120)

If the project is to be permitted under s. 88.3 1, Wis Stats., the application must contain:

a. A certified copy of the petition for establishment of the drainage district.

b. The report of the drainage district board.

c. A statement that the public health or welfare will be promoted by this project.

d. A statement that public rights will not be materially impaired by this project.

e. A statement that the public uses will not be materially impaired by this project.

f. A plan view of the project.

g. A profile of the stream bed before and after.

h. Existing and proposed cross sections.

i. Existing hydraulic structures such as dams or bridges on the waterway within the project area and within 1,000 feet.

j. A complete hydraulic analysis may be required from the applicant depending upon the complexity of the project.

k. Section 88.3 1, Wis. Stats., requires that the application "shall be duly verified." In order to meet this requirement, the application should be signed and notarized by all three Board members.

1. Any other information needed to determine if the project is necessary and will promote public health and welfare.

NOTICE REQUIREMENTS

After the Department receives a completed application under s. 88.31, Stats., it must set a time and place for a hearing between three and eight weeks after receipt. Note that the Department does not consider an application complete until the required environmental impact assessment is completed.

The notice procedure is under s. 88.05, Wis. Stats., which specifies a class three hearing notice. The Statute requires that the mailing list include the chairman of the county highway committee, the chairman of the soil and water conservation district in the county involved, the secretary of the Department, any railroad company involved and all owners of record whose land may be affected.

The removal of dams by drainage districts is treated somewhat differently and requires the notice procedure provided by s. 31.06, Wis. Stats.

FIELD INVESTIGATION AND REVIEW CONSIDERATIONS

After a application is received a field investigation will be made by Department staff to determine whether the required findings of fact can be made. A field investigation form (3500-23) should be completed. Types of information to be considered during the field investigation and technical review include:

1. Structures

   The applicant should have provided information about structures (culverts, bridges, dams) in the area of the proposed drainage project. (See Chapter 70, Structures.)

   If there are any other structures present, such as dikes, levees, retaining walls or training walls, make a sketch of them and include dimensions. Prepare a scaled map and take photographs if necessary. Any obstructions to the flow of water should be noted and sketched.

2. Stream Characteristics

   Take representative photographs upstream and downstream of the project site. Examine the bank and bed materials to determine the cohesiveness of the material and the organic content. To estimate these parameters, pick up a sample and squeeze it to determine cohesiveness. Note color and odor to indicate organic content.

   The condition of the bank and any indication of slumping, erosion or failure should be noted and documented. The angle of repose is one way of determining whether the stream bank is stable. This angle may be estimated by finding a stable bank and measuring the slope of the bank. If none of the adjacent banks are stable, the angle of repose will have to be estimated based on the existing soil and its measurable properties. (See handout "Saving Your Shoreline" for further grading information.)

3. Flood Flow Capacity

   An altered watercourse must have a hydraulic capacity at least as great as the section it is replacing. In practice, the capacity is generally evaluated during bank full conditions. Normally, straightening a stream or dredging it out will increase the flow capacity through the project site, although, undersizing could exacerbate flooding.

The biggest hydraulic problem with drainage projects will probably be the aggravation of downstream flooding. As the stream channel extends into the upper reaches of the basin and the lower reaches become straighter, storage is removed from the area. The result is that flood waters reach the down stream areas quicker and in higher volumes. Increases due to small projects will be hard to document. As projects increase in size, they may merit a more detailed analysis in an attempt to model the effects of lost basin storage. If it can be shown that downstream flooding will be increased, the riparians affected should be notified and give their consent pursuant to NR 116.

Some projects may be overdesigned in an attempt to reduce flooding. Overdesign is a common problem with drainage projects which can result in excessively low normal stream velocities. Constant low stream velocities will result in rapid sedimentation within the channel and a shortening of the dredging cycle. Scour is a necessary channel characteristic which must occur frequently from a channel maintenance standpoint and a fishery standpoint, yet excessive scour can quickly destroy a drainage project. The balancing point is a channel which scours clean and a bank which remains stable. One solution to overdesign may be the addition of a sub channel which helps confine lower frequency events and drives normal velocities upward. Hopefully the smaller channel will scour out on a periodic basis.

4. Erosion and Slumping

Most stream straightening increase flow velocities by shortening the channel length which in turn steepens the gradient. This can result in increased bed and bank erosion. The significance of increased flow velocities depends upon the bed and bank material. Coarse, rough materials like cobbles and gravel are more resistant to erosion than clay, fine sand and unconsolidated sediment which may be very sensitive to increased velocities. If erosion is a problem, the applicant should be required to place riprap or other erosion control devices in appropriate places.

The review should also evaluate possible downstream effects of the project, including increased erosion of downstream riparian's land or potential erosion and undermining of downstream structures. The banks may become unstable if velocities or flow volumes are increased. The investigator must be satisfied that downstream bank slopes will be stable before approving the project. Riprap should be required where necessary.

5. Soil Disposal

Dredge spoil should be placed to minimize the possibility of erosion back into the ditch. A requirement in the permit to level all spoil material and seed and mulch the bank area and spoil deposits may suffice.

6. Timing of Project

Timing of stream dredging or straightening is important to insure revegetation and stabilization of ditch banks and immediate upland areas. Work in drainage ditches has traditionally occurred during the winter time. This practice is popular because of the ability to enter to work site on frozen ground. During the winter contractors and equipment are generally readily available. Work done in the winter presents a maximum opportunity for erosion and sedimentation because the disturbed areas will be unprotected and unstable during spring runoff. Little opportunity exists to reduce erosion potential for work done in the winter. A straw or chopped stalk mulch layer will help to reduce erosion and sedimentation. Because of the potential for damage to the stream due to winter dredging operation, we should discourage it whenever reasonable alternatives exist.

Timing is also important to fish spawning activities. Dredging during spawning, incubation and fry periods should be discouraged.

7. Biological - Chemical

Drainage projects may be detrimental to fish and wildlife due to increased erosion and sedimentation, changes in the surrounding water table, streambed disturbance or changes in the stream's flow characteristics. Large tracts of diverse wetlands may also be converted to uplands destroying critical wildlife habitat.

The field investigation by Department staff must include a determination and evaluation of the fishery and wildlife values in the project area and the effect to the project upon them.

Staff should document any objections to the project and suggest possible ways to minimize the project impacts. If the protect will significantly damage habitat and the damage cannot be minimized, they should object to the issuance of the permit.

Some possible effects of drainage projects that should be considered in any evaluation include:

A. Increased turbidity:

Suspended solids will increase at the site and downstream when the channel is straightened or dredged. Suspended solids will remain high as the channel adjusts to new velocities, gradient, bank and bed material. Bed material movement will increase in the new channel and the new bed will lack organic food and substrate material.

Light transmission will be temporarily reduced in the new channel and downstream because of the increased sediment transport.

Erosion and sedimentation have been described as having the most insidious effects on aquatic life, in that the process may go unnoticed and the damage can be widespread, cumulative and permanent. Unlike most causes of poor water quality, erosion and the resulting increase in sediment transport may be triggered by drainage projects and then may continue to increase or even accelerate after the drainage project has been completed. The impacts of drainage projects may persist on site and downstream for years as a result of thalweg establishment and channel adjustments.

B. Temperature change:

Excavation of an existing ditch or new channel is preceded by clearing and grubbing. The loss of streamside vegetation may increase the daily fluctuation of water temperatures. Daytime temperatures will increase and nighttime temperatures will decrease. Also, daytime temperatures may be reduced because of higher flow velocities.

C. Habitat loss:

Drainage projects can result in a straight uniform channel. Pools, riffles, undercut banks and other preferred habitat are eliminated. Total water edge habitat will be reduced significantly. Diverse wetland may be converted to upland.

D. Runoff:

Drainage projects may also increase or decrease runoff and sediment discharge from the adjacent land. If the runoff is agricultural drainage, salts, nutrients and pesticides may be added to the

stream. Improved drainage can increase the rate of groundwater discharge resulting in a lowering of the water table and less water for sustaining stream flows during dry periods.

E. Levels and Flow:

Drainage projects may have a significant impact on levels and flows in adjacent bodies of water. Impacts on adjacent bodies of water should be thoroughly investigated. If the drainage ditch is controlled by a dam, levels and flows should be specified within the order.

8. Other Public Rights

As stated earlier, scenic beauty in s. 88.31, Wis. Stats., is stated as a public right to be considered by the Department. Few of us are experts in defining scenic beauty. Fortunately, both Dan Holzman and Scott Hausmann of the central office are experts in scenic beauty. They should be consulted on all drainage district projects and especially where a little extra hot air is needed. Changes in navigation are also public rights which must be considered.

FINAL DISPOSITION

A permit for new drainage projects or to straighten, deepen or clean existing ditches under s. 88.31, Wis. Stats., will be issued or denied by a Division of Natural Resources Hearing Examiner.

Any person objecting to the decision issuing or denying a permit may seek judicial review by serving and filing a petition in accordance with the provisions of s. 227.15 and 227.16, Wis. Stats., within 30 days of the decision date.

MONITORING

Permits issued under s. 88.31, Wis. Stats., should require a five day notice period to the Water Management Specialist before the start of construction. The Department staff should inspect the project to make certain that the permit is complied with. Drainage Boards are required by Statute to inspect ditches within the District and assess needed maintenance on an annual basis. These annual inspections are a good time for Department staff to evaluate the success of past projects, as well as the need for future projects.

EMERGENCY PROCEDURES

There should be no emergency issuance of ss. 88.31 or 88.72, Wis. Stats., permits. Obstruction to natural flow that appears to be an emergency may be handled by individuals under the provisions of s. 88.90, Wis. Stats.

ENLARGEMENTS

The September 11, 1974, Attorney General's opinion, 63 OAG 355 (1974), clearly states that the exemption for agricultural enlargements does not apply to drainage districts. Therefore, all new ditches within drainage districts draining into navigable streams require permits under s. 88.31, Wis. Stats.

EDUCATIONAL

Generally wetland preservation will be our main educational thrust. We should concentrate on the many beneficial effects wetlands have on our ecological system.

Publications which may be useful.

1. "Wetland Use in Wisconsin" DNR - 1976
2. "Protecting Wetlands in Shoreland Areas" - DNR

REGULATIONS

a) Statutes: 30.195, 30.20, 31.02, 88.31, 88.72, 88.90
b) Administrative Codes: NR 195, NR 115, NR 116, NR 150, NR 345, NR 347
c) Manual Codes: 3506.1
d) Court Cases: Rude v. St. Marie, 121 Wis. 634. (1903), In Re Horicon Drainage District, 136 Wis. 227 (1908), In Re Dancy Drainage District, 129 Wis. 129 (1906)
Legal Opinions: 63 OAG 355 (1974)

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